

THE *Ogyris idmo* HEWITSON COMPLEX (LEPIDOPTERA: LYCAENIDAE) AS FLAGSHIP SPECIES FOR CONSERVATION IN SOUTHERN AUSTRALIA

ROSS P. FIELD

Museum of Victoria, PO Box 666E, Melbourne, Vic. 3001, Australia

Abstract

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The *Ogyris idmo* Hewitson complex consists of at least two large and spectacular butterflies only one of which is named. *O. idmo* is rare but widespread in the south-western corner of Western Australia and extremely rare in south-western Victoria and southern South Australia. Another undescribed rare species is currently known only from small areas near Kalgoorlie, Western Australia, Waikerie, South Australia and Ouyen, Victoria. All populations of both species are closely associated with one, or possibly two species of ants from the *Camponotus 'myoporos'* Clark group. Unlike other species of *Ogyris*, the larvae do not feed on mistletoes or other parasitic plants. There is evidence to suggest that for both species the eggs are deposited in or near the entrance to the ant nest, and the entire larval stage of the butterfly is completed within the nest, possibly as a predator of immature ants. There have been no confirmed records of *O. idmo* outside WA in over 40 years. The populations of the undescribed species are extremely small and/or vulnerable, that near Kalgoorlie being in a high-use recreation area, the population near Waikerie is in a roadside remnant of mallee vegetation surrounded by intensive agriculture and the recently discovered population near Ouyen is in a park reserve. Museum records indicate that the undescribed species also occurred at Broken Hill in New South Wales and at Mildura in Vic. The broad distribution of both species suggests that suitable habitat still exists for their continued survival. However, little is known about the biology of the butterfly and the intricate association it has with *Camponotus* ants. Studies on the ecology and distribution of these butterflies need to be undertaken so that their future survival can be assured. These species make ideal flagship species for conservation efforts in arid and semi-arid areas across southern Australia.

Introduction

The genus *Ogyris* Westwood, commonly called azures, contains some of the largest and most brilliantly coloured butterflies of the family Lycaenidae and yet their elusive nature has meant that they are seldom seen by the general public. McCubbin (1971), suggested that fewer than 1 person in 10,000 has ever seen a live *Ogyris* adult, although some species are not uncommon close to Perth, Adelaide, Melbourne, Sydney, and Brisbane. There are 15 named species in the genus, 12 occur in Australia and the other 3 are found in Papua New Guinea (Common and Waterhouse, 1981). Of the Australian species, the larvae of 10 are known to feed on mistletoes, often growing high in the tree tops. The butterflies usually fly close to their food plant and are therefore not often observed. Of the other 2 Australian species, one also feeds on parasitic plants, *Choretrum glomeratum* R. Br. and *Leptomieria preissiana* (Miq.) A. DC., both bushy root parasites. The remaining species, *Ogyris idmo* Hewitson, is the largest

and rarest species in the genus and the second largest lycaenid in Australia. The life history of this species is unknown, yet it is believed not to feed on parasitic plants (Common and Waterhouse, 1981).

As with most species of Lycaenidae, all the *Ogyris* have a strong association with ants. Of the 11 Australian species where the life history is known, this association is symbiotic, with the larvae and pupae of the butterfly presumably obtaining some protection from predators and parasites, while the ants obtain sugar secretions harvested from abdominal glands on the immature stages (Common and Waterhouse, 1981). In many cases the larvae live in the ants' nest, often at the base of the tree bearing the mistletoe and emerge at night, with ants in attendance to search for food. Pupation often occurs in the ants' nest, usually close to the entrance where escape by the butterfly is less hazardous. For *O. idmo*, the life history is largely unknown although the species is thought to be univoltine with the eggs being laid into nests of ants from the *Camponotus 'myoporos'* Clark group during

November. The larvae are thought to be predatory on immature ants (Common and Waterhouse, 1981). An unnamed species of *Ogyris* closely resembling *O. idmo*, occurs near Kalgoorlie, Western Australia, near Waikerie in South Australia and near Ouyen in Victoria. This species is also associated with ants from the *Camponotus* 'myoporus' group, but possible a different species from that associated with *O. idmo*. This butterfly seems to be bivoltine with flight periods in the spring and autumn. The eggs are laid on bark close to the ground at the entrance to the ants' nest.

Distribution of the *O. idmo* complex

Two subspecies of *O. idmo* are recognised (Common and Waterhouse, 1981; Dunn and Dunn, 1991). *O. i. idmo* Hewitson occurs in south-western WA, from Cape Arid National Park (east of Esperance), the Stirling Ranges, Windy Harbour (R. Hay pers. comm.), near Perth, and recently at Port Denison 300 km N of Perth (Williams et al., 1995). *O. idmo halmaturia* Tepper is known from western Vic. and southern SA, including Kangaroo Island. Nowhere is the species abundant and there are no museum records of *O. idmo* outside WA in over the last 40 years. However, in recent years the species has been locally common near Perth and at Mt Ragged in Cape Arid National Park (Field, 1987, 1990). The population at Cape Arid National Park is morphologically distinct from the typical ssp. *idmo* (Field, 1990) and the northern population (Port Denison) is intermediate in appearance between the typical populations from near Perth and that from Cape Arid National Park (Williams et al., 1995). Figure 1 shows the known distribution of *O. idmo* and locations with similar climates derived using CLIMEX (Sutherst and Maywald, 1985) based on a 0.65 match of climate (temperature maximum and minimum and rainfall pattern and total) to Esperance, WA. Locations with climates similar to Esperance mirror closely the known distribution of *O. idmo*, including the recent range extension of the species to Port Denison, 300 km N of Perth.

In WA, the undescribed *Ogyris* sp. is known only from near Kalgoorlie, over a few square kilometres to the north-east of Lake Douglas. This same species occurs locally at Ramco, near Waikerie in SA and from near Ouyen, Vic. and was recorded from Mildura, Vic. in October 1972 (B. Vardy collection) and from Broken, Hill, NSW in December 1912 (Museum of Victoria). The CLIMEX prediction for the species

based on a 0.7 climate match with Kalgoorlie includes large inland areas of south-western NSW, inland south-eastern SA and inland south-eastern WA (Figure 2).



Figure 1. Known distribution of *Ogyris idmo* (enclosed regions) and locations with climate matches (I) using CLIMEX (CSIRO) of at least 0.65 with Esperance (o). The largest dots have the closest climate match with Esperance and represent locations with the highest probability of finding populations of *O. idmo*.

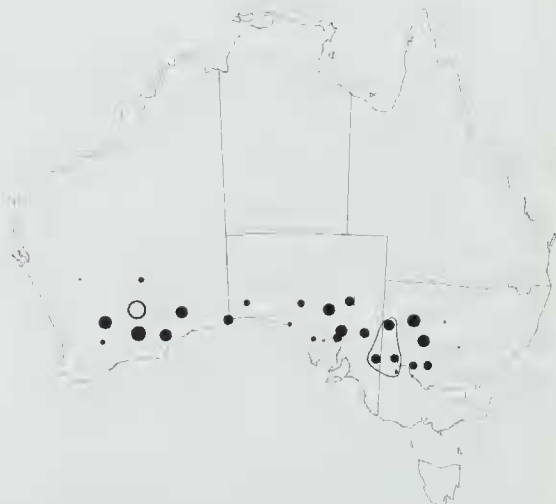


Figure 2. Known distribution of *Ogyris* sp. (enclosed regions) and locations with climate matches (I) using CLIMEX (CSIRO) of at least 0.7 with Kalgoorlie (o). The largest dots have the closest climate match with Kalgoorlie and represent locations with the highest probability of finding populations of *Ogyris* sp.

Conservation status of the *O. idmo* complex

Although rare, *O. i. idmo* is widespread in south-western WA and occurs in a variety of habitats. Many of the sites where locally abundant populations occur are disturbed sites (Table 1). The disturbance, either through fire or some minor physical disruption of the soil, appears to favour the survival of the ant species on which the butterflies depend. At Mt Ragged an intense fire during February 1991 destroyed all above ground vegetation, however, this bright blue form (females only) of *O. i. idmo* was extremely abundant the following October (confirming that the immature stages are subterranean) and again quite rare in October 1993 and 1994. The butterflies appear to be widespread in Cape Arid National Park and at times are abundant near Mt Ragged. Specimens of this form are also known from near Scadden, 150 km to the west. The more western populations of *O. i. idmo* often occur near urban areas, plantation forests, easements and in recently burnt areas. The species also occurs in reserves such as the Stirling Ranges National Park where fire is the most influential environmental process.

The populations of *O. i. halmaturia* from South Australia and Victoria may all be extinct largely as a result of land clearing. No confirmed records from Vic. have been made since 1945

(Table 1) although many early records (Nov 1939) were adjacent to the Little Desert National Park where the dependent ant still exists. Kangaroo I. may offer the best chance of rediscovering the butterfly in SA. The ant is still abundant on the island both inside and outside the conservation parks. Kangaroo I. is also a major stronghold for the rare *Ogyris otaues* C. and R. Felder (Fisher, 1978), a species that feeds on *Choretrum glomeratum*. *O. otaues* has the same attendant *Camponotus* species that is associated with *O. idmo* and at at least one location in WA the two species of butterflies are sympatric (Williams et al., 1995).

The undescribed *Ogyris* species occurring at Lake Douglas, near Kalgoorlie, is only known from an area of a few square kilometres. The colony occurs within a public recreation area that can be subjected to significant human interference with numerous vehicle tracks crossing the main breeding areas. In some years since its first discovery in the early 1980s, the butterflies have been common but few specimens have been seen since 1991. This species also occurs in a small remnant roadside strip of mallee vegetation near Waikerie in SA. This site is surrounded by citrus orchards and vineyards that are subject to pesticide sprays that coincide with the flight periods of the butterfly. The butterflies at this site also tend to fly commonly in the

Table 1. Conservation status of the *Ogyris idmo* complex

Taxon	Location	Last captures	Status	Disturbance
<i>O. i. idmo</i>	Darling Range (near Perth) WA	1994	rare	Urban development/ Forestry/Fire
	Port Denison	1994	rare	Township development
	Cape Arid NP WA	1994	rare (secure)	Fire
<i>O. i. halmaturia</i>	Kangaroo Is. SA	1934	extinct	Fire
	SA mainland	1951	vulnerable	Agriculture
	Kiata Vic	1945	extinct	Fire/Agriculture
"Kalgoorlie" <i>Ogyris</i> sp	Lake Douglas WA	1993	rare	Recreation
"Waikerie" <i>Ogyris</i> sp	Ramco SA	1996	vulnerable	Agriculture
	Ouyen Vic	1996	unknown (secure)	unknown (site in park reserve)
	Mildura Vic	1972	endangered	Grave digging
	Broken Hill NSW	1912	extinct?	

adjoining farmland as well as in the breeding area. Until 1996 the only confirmed Victorian site for this species was adjacent to the Mildura cemetery. Specimens had been caught in October of 1972, the season prior to several seasons of extensive flooding from the Murray River which inundated the site and may have caused the demise of the population. The ants are still very abundant at the site so that recolonisation by the butterflies, either naturally or by artificial reintroduction is a distinct possibility. However, two specimens were taken during February and April 1996 near the Pink Lakes, west of Ouyen where the attendant ants were in high numbers over large areas containing open mallee vegetation. It was at this site in April 1975 that Charles McCubbin (personal communication) had observed several specimens flying that were thought to have been *O. idmo halma-turia*. Given the time of the year, these specimens were undoubtedly the undescribed *Ogyris* sp. A single specimen from Broken Hill in the Museum of Victoria (Dunn and Dunn, 1991) is also thought to belong to this species but the precise location of the site is unknown.

The rare and possibly predatory nature of the species in the *Ogyris idmo* complex has provided a fascination amongst lepidopterists for many years. The unusual association with ants that exists with the complex provides an opportunity to highlight this interaction in broader conservation programs. The complex and the ants could thus be used as flagship species in the advocacy of conservation of biodiversity in areas where the complex exists now, potentially may occur, or has occurred in the past. It is important that the ecology of these species is elucidated as soon as possible so that a greater

understanding of the influence of disturbance can be predicted.

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